

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

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SUBJECT: Additional Risk Assessment
Information: Berkley Products,
Leachate

DATE: 8-30-95

FROM: Jennifer Hubbard, Toxicologist
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TO: Jim Feeney, RPM
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This memo is in response to your request for an evaluation of historical sample L-1, a liquid-phase leachate seep sample.

If the results are screened using the surface water risk-based concentrations (RBCs) (derivation of surface water RBCs are explained in the baseline risk assessment, Section 5 of the Remedial Investigation), it can be seen that only three chemicals would not immediately drop out of consideration as chemicals of potential concern (COPCs):

CHEMICAL	CONC. IN L-1 (ug/l)	SW RBC (ug/l)
BENZENE	8 L	800
ETHYLBENZENE	11 L	1800000
XYLENES	40 L	35000000
4-CHLORO-3-METHYLPHENOL	44	--
ALUMINUM	23700	1900000
BARIUM	679	130000
BERYLLIUM	1.1	4.8
CADMIUM	8.9	6
CALCIUM	71800	--
CHROMIUM	99.9	9000
COBALT	19.8	110000
COPPER	21.4	70000

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CHEMICAL	CONC. IN L-1 (ug/l)	SW RBC (ug/l)
IRON	90900	--
LEAD	38.7	--
MAGNESIUM	19000	--
MANGANESE	1300	9000
NICKEL	44.9	35000
POTASSIUM	28400	--
VANADIUM	32.6	13000
SODIUM	112000	--
ZINC	212	550000
CYANIDE	15.6	35000

L = Biased low

SW = Surface water

RBC = Risk-based concentration

Iron, calcium, sodium, magnesium, and potassium are essential nutrients and common elements and would not be selected as COPCs. All other chemicals are below screening RBCs except cadmium; 4-chloro-3-methylphenol and lead do not have RBCs.

4-Chloro-3-methylphenol is an uncommon chemical for which no quantitative toxicity criteria have been established. This chemical is used as an external germicide and a preservative in glues, inks, and textiles (Verschuieren, 1983). EPA's National Center for Environmental Assessment has stated that information is insufficient to establish a provisional quantitative dose-response parameter.

Lead is evaluated using the Integrated Exposure Uptake Biokinetic Model. Default and site-specific runs of this model are presented in the baseline risk assessment. If the water is adjusted to accommodate incidental ingestion of the leachate at a rate of approximately 1 mL per day, with the concentration of 38.7 ug/l lead, keeping other default input parameters the same, no increase in the default blood lead levels was observed. (The default blood lead levels are geometric means of approximately 3-4 ug/dL blood lead with approximately 1-2% of the population having a blood lead above 10 ug/dL.)

The cadmium concentration exceeded the screening RBC. The following conservative assumptions may be used to estimate non-cancer risk from cadmium in leachate: incidental leachate

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ingestion rate of 1 mL per day (professional judgment; approximately equal to 15-20 drops), 350 days/year (default residential exposure rate), 1800 cm² for children and 3000 cm² for adults for exposed skin surface area (EPA, 1989a; hands, arms and feet), 2.6 hours/day (EPA, 1989b; default swimming duration), 6 years for a 15 kilogram child and 24 years for a 70 kilogram adult. In this case, the estimated Hazard Index (HI) for cadmium would be approximately 0.1 for a child and 0.04 for an adult. These HIs incorporate an oral reference dose (RfD) of 5E-4 mg/kg/day for cadmium in water and a dermal RfD of 2.5E-5 mg/kg/day (EPA, 1995). These HIs are expected to be conservative because they assume daily, prolonged contact with leachate.

To summarize, the leachate does not appear to contribute risks in excess of EPA's target risks (1E-4 to 1E-6 cancer risk, Hazard Index of 1), and is not expected to be associated with increased blood lead, even under highly conservative scenarios. 4-Methyl-3-chlorophenol could not be quantitatively evaluated.

REFERENCES

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EPA, 1994. Integrated Exposure Uptake Biokinetic Model for Lead in Children. Version 0.99d. Office of Emergency and Remedial Response, Washington, D.C.

EPA, 1995. Integrated Risk Information System (IRIS).

Verschueren, K., 1983. Handbook of Environmental Data on Organic Chemicals. Second Edition. Van Nostrand Reinhold Co., New York.

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